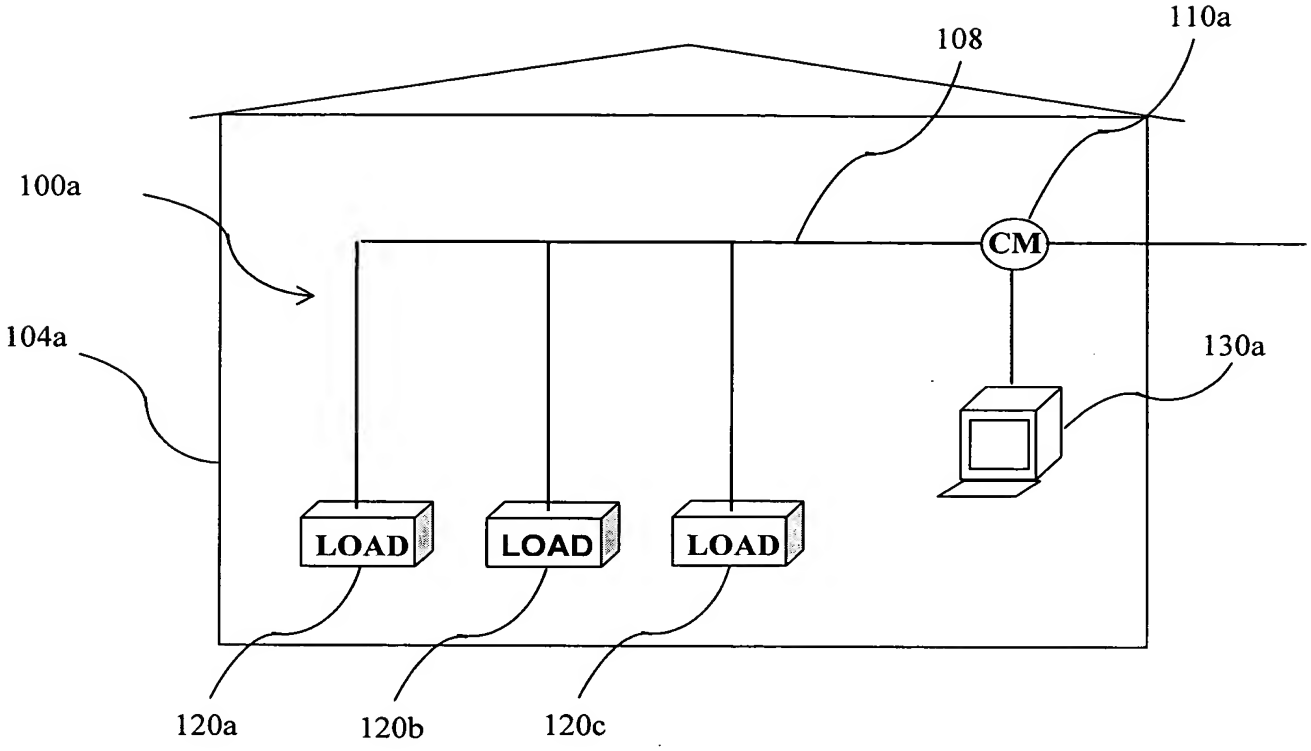
FIG. 1


110a
108
100a
CM
104a
130a
LOAD
LOAD
LOAD
120a
120b
120c

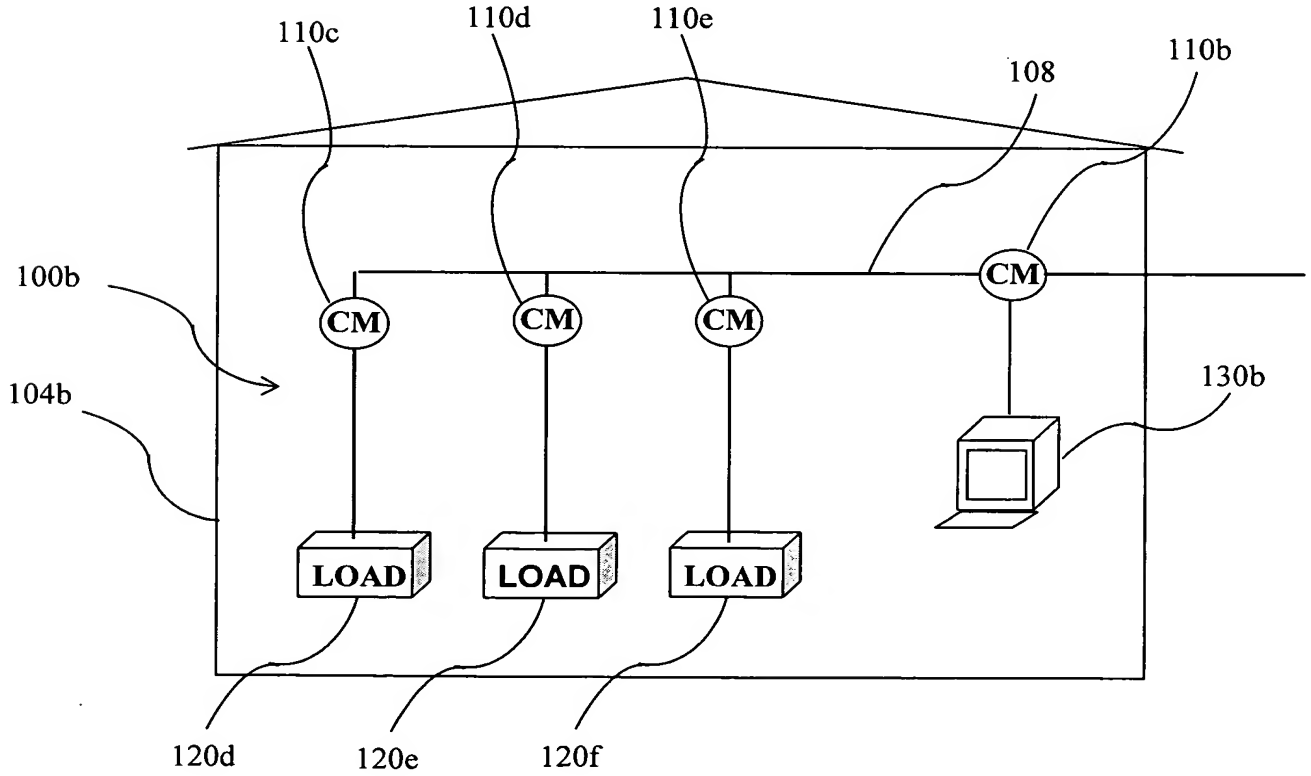
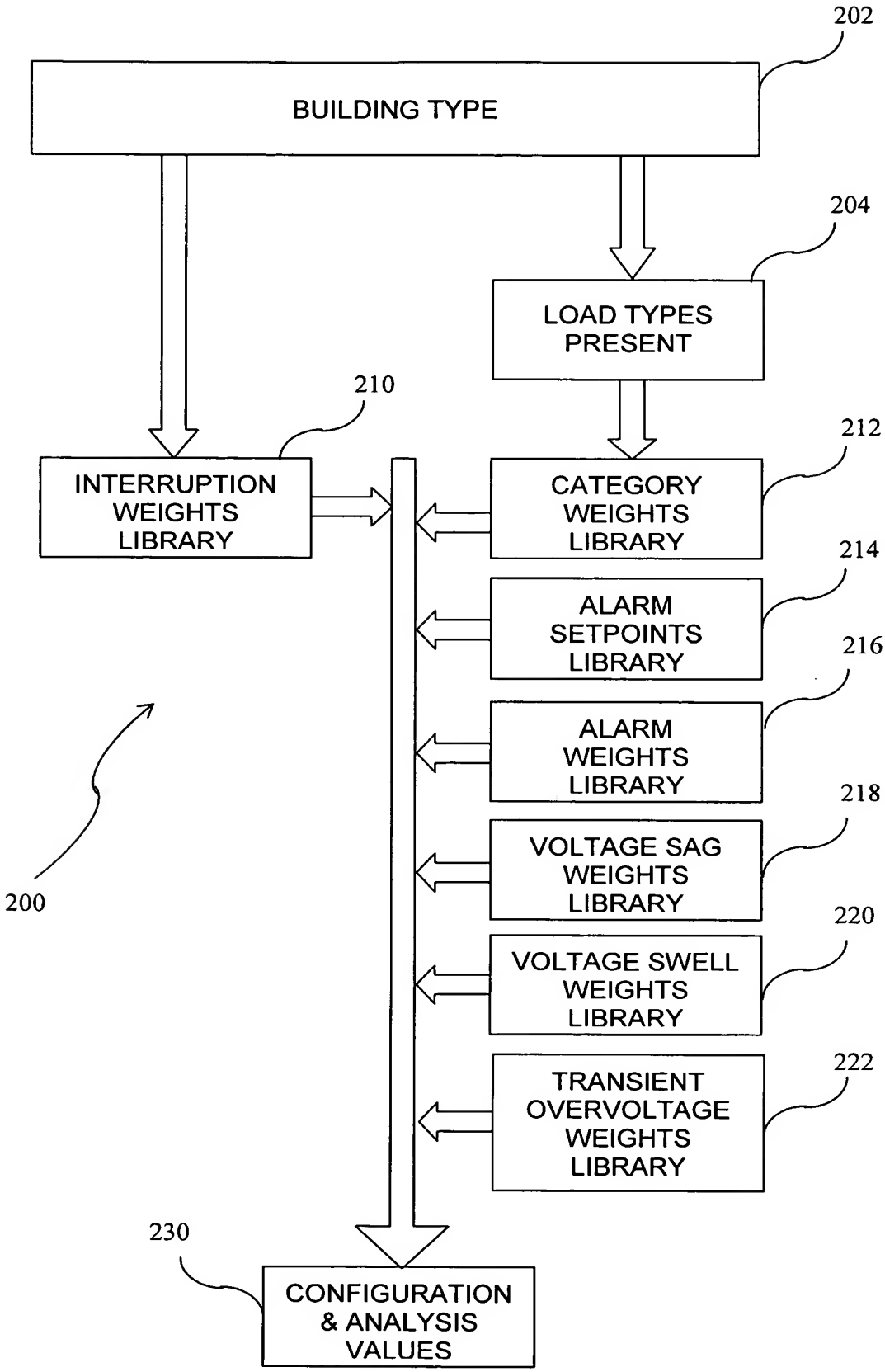

110c
110d
110e
110b
108
100b
CM
CM
CM
CM
104b
130b
LOAD
LOAD
LOAD
120d
120e
120f

FIG. 2


202
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INTERRUPTION WEIGHTS LIBRARY
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CATEGORY WEIGHTS LIBRARY
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ALARM SETPOINTS LIBRARY
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CONFIGURATION & ANALYSIS VALUES

FIG. 3 – Building Types

1	Aircraft Hanger
2	Control Tower
3	Terminal
4	Emergency Response
5	Baggage Handling
6	Amusement Ride
7	Office Building
8	Restaurant
9	Retail
10	Classroom
11	Dormitory
12	Library
13	Data Processing
14	Barracks
15	Hospital
16	Semiconductor Fab Bldg
17	Waste Water Treatment Plant
18	Automotive Manufacturing
19	Food/Beverage Processing
20	Plastic Extrusion
21	Cement/Glass/Stone
22	Smelting
23	Paper/Wood/Pulp
24	Petrochemical Processing
25	Pharmaceutical Manufacturing
26	Printing and Publishing
27	Arena
28	Casino
29	Rubber/Plastics Processing
30	Metal Mining
31	Textile Manufacturing
32	Oil Drilling
33	Gymnasium
34	Utilities/Central Plant
35	Shipping
36	Warehouse
37	Furniture Manufacturing
38	Water Treatment
39	Parking Garage
40	Dairy
41	Gin
42	Bulk Mail Processing
43	Electronic Manufacturing
44	Railroad Systems
45	Water/Sewage Pumping Station
46	Oil Well

47	Agricultural Processing
48	Metal Foundry
49	Coal Mine
50	Slaughterhouse
51	Veterinary Medicine
52	Water Drilling
53	Bakery
54	Machine Shop
55	Communications
56	Aerospace Manufacturing
57	Public Transportation
58	Dock Shipping Shore Power
59	Banking Services
60	Hotel
61	Theatre
62	Nursing Home
63	Laboratory
64	Zoo
65	Church
66	Courthouse
67	Correctional Institution
68	Aerospace Control

FIG. 4 – Load Types Present Library (excerpt)

Building Type	Motors, Polyphase, Induction	Motors, Polyphase, Synchronous	Motors, DC Gear	Motors, DC Brushless	Motors, DC Servo	ASD, DC	ASD, AC PWM	ASD, AC CSI	ASD, AC VSI	Lighting, Fluorescent	Lighting, Incandescent	Lighting, HP Sodium	Lighting, LP Sodium	Lighting, Mercury Vapor	Lighting, Metal Halide	Lighting, Tungsten Halogen
Aircraft Hanger	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1
Control Tower	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Terminal	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
Emergency Response	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
Baggage Handling	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Amusement Ride	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Office Building	1	1	0	0	0	1	1	1	1	1	1	0	0	0	0	0
Restaurant	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Retail	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Classroom	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Dormitory	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0

FIG. 5 – Interruptions Weighting Library (excerpt)

		Daily		Weekly		Monthly	
Building Type	Interruption Weighting Library	Short-term Interruption (< 3 Min)	Long-term Interruption (>= 3 Min)	Short-term Interruption (< 3 Min)	Long-term Interruption (>= 3 Min)	Short-term Interruption (< 3 Min)	Long-term Interruption (>= 3 Min)
DEFAULT	0	1	1	2	2	3	3
Aircraft Hanger	1	1	1	2	2	3	3
Control Tower	2	1	1	1	1	1	1
Terminal	3	1	1	2	2	3	3
Emergency Response	4	1	1	2	2	3	3
Baggage Handling	5	1	1	2	2	3	3
Amusement Ride	6	1	1	2	2	3	3
Office Building	7	1	1	2	2	3	3
Restaurant	8	1	1	2	2	3	3
Retail	9	1	1	2	2	3	3
Classroom	10	1	1	2	2	3	3
Dormitory	11	1	1	2	2	3	3

FIG. 6 – Category Weights Library

Load Type	Category Weights Library	Undervoltage	Overvoltage	Voltage Unbalance	Waveform Distortion	Frequency Deivation	Interruptions	Voltage Sags	Voltage Swells	Flicker	Transient Overvoltages
DEFAULT	0	10	9	4	8	4	10	10	8	4	8
AC Motors	1	10	10	10	7	3	10	10	7	2	8
DC Motors	2	10	10	10	7	3	10	10	7	2	8
ASDs	3	10	10	8	10	3	10	10	8	3	8
Lighting 1 (Inc., Fluor.)	4	7	8	0	5	3	10	10	6	8	5
Lighting 2 (HID)	5	9	8	0	5	5	10	10	6	7	5
Computers	6	10	9	0	8	3	10	10	9	2	8
Medical Imaging Equipment	7	10	9	0	8	3	10	10	9	2	8
Semiconductor Mfg. Equipment	8	10	9	0	8	3	10	10	9	2	8
CNC Machine Tools	9	10	9	0	8	3	10	10	9	2	8
Office Equipment	10	10	9	0	8	3	10	10	9	2	8
Arc Furnaces	11	9	9	5	10	3	10	10	8	8	5
Capacitors	12	10	10	8	10	3	3	5	5	5	5
Transformers	13	10	10	10	8	3	0	0	0	5	8
Reactors	14	8	8	8	0	0	0	8	8	0	0

FIG. 7 – Alarm Setpoints Library

Load Type	Alarm Setpoint Library	Undervoltage Level 1	Undervoltage Level 2	Overvoltage Level 1	Overvoltage Level 2	Voltage Unbalance Level 1	Voltage Unbalance Level 2	Over THD Level 1	Over THD Level 2	Over Worst Harmonic Level 1	Over Worst Harmonic Level 2	Over Frequency Level 1	Over Frequency Level 2	Under Frequency Level 1	Under Frequency Level 2	Over Flicker Level 1	Over Flicker Level 2
DEFAULT	0	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Motors, Polyphase, Induction	1	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Motors, DC Gear	2	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
ASD, DC	3	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Lighting, Flourescent	4	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Lighting, HP Sodium	5	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Computers	6	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Medical Imaging Equipment	7	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Semiconductor Manufacturing Equipment	8	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
CNC Machine Tools	9	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Office Equipment (copiers, printers)	10	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Arc Furnace	11	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Capacitors	12	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Transformers	13	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100
Reactor	14	9500	9000	10500	11000	150	200	400	500	250	300	10050	10083	9950	9917	50	100

FIG. 8 – Alarm Weights Library

Load Type	Alarm Weighting Library	Undervoltage Level 1	Undervoltage Level 2	Overvoltage Level 1	Overvoltage Level 2	Voltage Unbalance Level 1	Voltage Unbalance Level 2	Over THD Level 1	Over THD Level 2	Over Worst Harmonic Level 1	Over Worst Harmonic Level 2	Over Frequency Level 1	Over Frequency Level 2	Under Frequency Level 1	Under Frequency Level 2	Over Flicker Level 1	Over Flicker Level 2
DEFAULT	0	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Motors, Polyphase, Induction	1	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Motors, DC Gear	2	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
ASD, DC	3	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Lighting, Flourescent	4	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Lighting, HP Sodium	5	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Computers	6	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Medical Imaging Equipment	7	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Semiconductor Manufacturing Equipment	8	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
CNC Machine Tools	9	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Office Equipment (copiers, printers)	10	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Arc Furnace	11	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Capacitors	12	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Transformers	13	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60
Reactor	14	240	120	240	120	600	100	600	10	600	10	120	30	120	30	800	60

FIG. 9 – Voltage Sags Weighting Library (excerpt)

	Duration (t) seconds										
Depth (D) % Nominal	0.01<= t < 0.02	0.02<= t <0.05	0.05<= t<0.1	0.1<= t <0.2	0.2<= t <0.5	0.5<= t <1	1<= t <3	3<= t <10	10<= t <20	20<= t <60	60<= t <180
10 <= D < 20	ok	ok	ok	ok	ok	ok	ok	ok	1	1	1
20 <= D < 30	ok	ok	ok	ok	ok	1	1	1	1	1	1
30 <= D < 40	ok	1	1	1	1	1	1	1	1	1	1
40 <= D < 50	ok	1	1	1	1	1	1	1	1	1	1
50 <= D < 60	ok	1	1	1	1	1	1	1	1	1	1
60 <= D < 80	ok	1	1	1	1	1	1	1	1	1	1
80 <= D < 99	ok	1	1	1	1	1	1	1	1	1	1

FIG. 10 – Voltage Swells Weighting Library (excerpt)

Magnitude (M) % Nominal	0.01<= t < 0.02	0.02<= t <0.05	0.05<= t<0.1	0.1<= t <0.2	0.2<= t <0.5	0.5<= t <1	1<= t <3	3<= t <10	10<= t <20	20<= t <60	60<= t <180
110 < M <= 120	ok	ok	ok	ok	ok	1	1	1	1	1	1
120 < M <= 130	1	1	1	1	1	1	1	1	1	1	1
130 < M <= 140	1	1	1	1	1	1	1	1	1	1	1
140 < M <= 150	1	1	1	1	1	1	1	1	1	1	1
150 < M <= 170	1	1	1	1	1	1	1	1	1	1	1
170 < M <= 200	1	1	1	1	1	1	1	1	1	1	1
M > 200	1	1	1	1	1	1	1	1	1	1	1

Fig 11 – Transient Overvoltage Weighting Library (excerpt)

	Duration (t) microseconds						
Daily Magnitude (M) % Nominal	t < 20	20 <= t < 50	50 <= t< 100	100 <= t < 200	200 <= t < 500	500 <= t < 1000	1000 <= t < 2000
200 < M <= 300	4	4	4	4	4	2	2
300 < M <= 400	4	4	4	4	2	2	2
400 < M <= 500	4	4	4	2	2	2	2
500 < M <= 600	4	4	3	2	2	2	2
600 < M <= 700	4	3	3	2	2	2	2
700 < M <= 800	4	3	3	2	2	2	2
800 < M <= 900	3	3	3	2	2	2	2
900 < M <= 1000	3	3	3	2	2	2	2
M > 1000	3	3	3	2	2	2	2

Fig 12 – Display of Overall Power Quality Index Summary

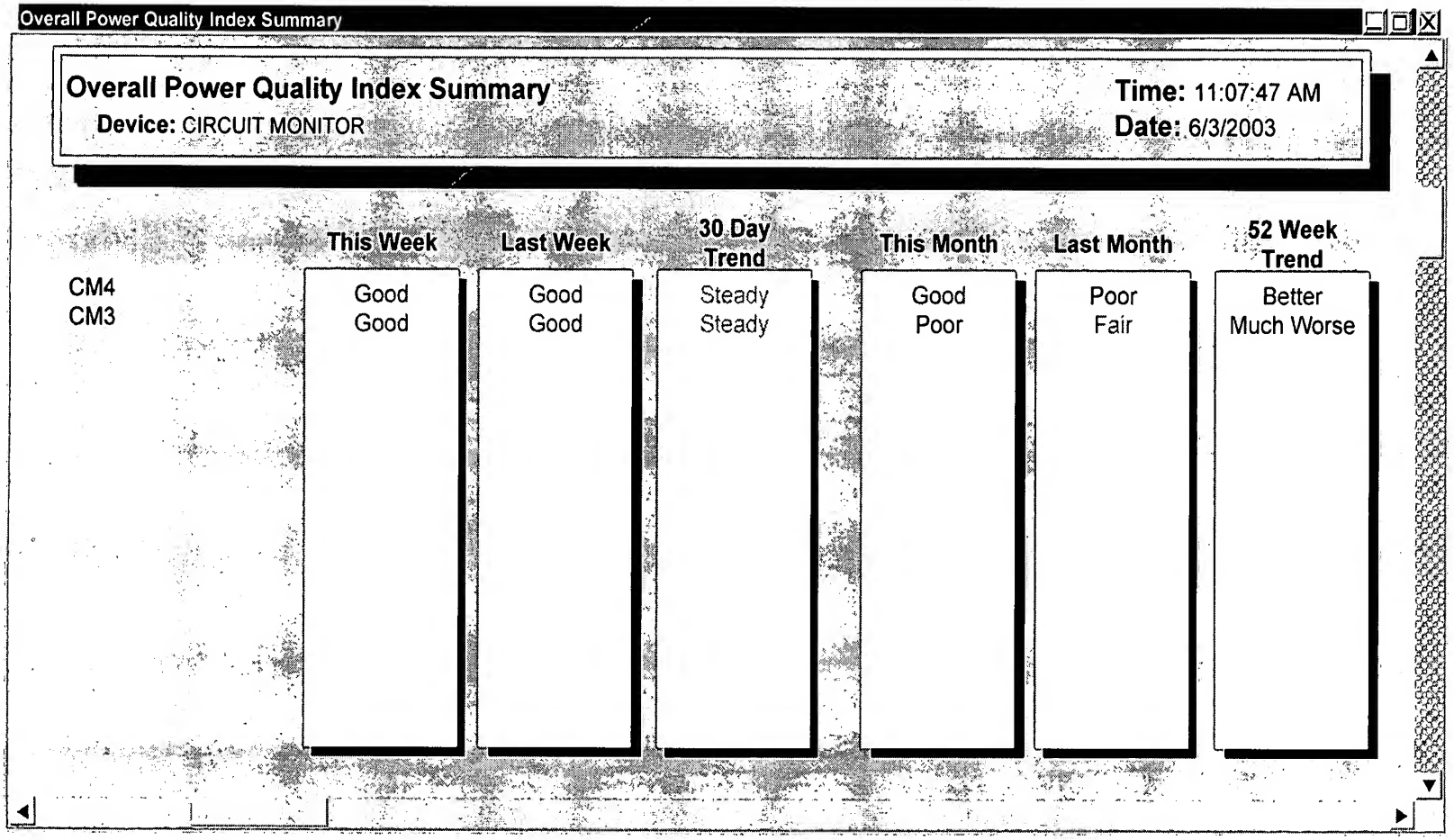
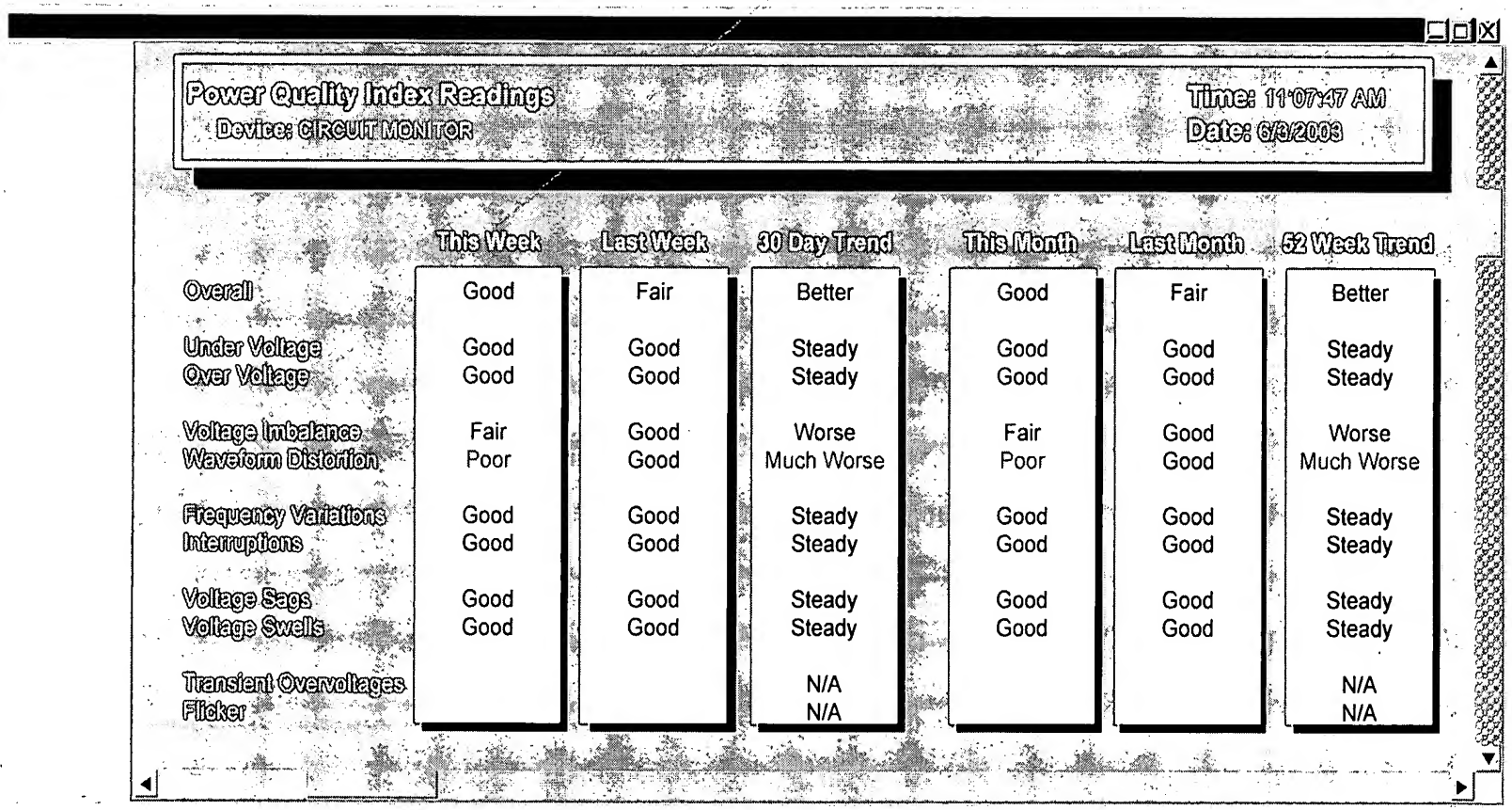


Fig 13 – Display of Power Quality Index Readings



	This Week	Last Week	30 Day Trend	This Month	Last Month	52 Week Trend
Overall	Good	Fair	Better	Good	Fair	Better
Under Voltage	Good	Good	Steady	Good	Good	Steady
Over Voltage	Good	Good	Steady	Good	Good	Steady
Voltage Imbalance	Fair	Good	Worse	Fair	Good	Worse
Waveform Distortion	Poor	Good	Much Worse	Poor	Good	Much Worse
Frequency Variations	Good	Good	Steady	Good	Good	Steady
Interruptions	Good	Good	Steady	Good	Good	Steady
Voltage Sags	Good	Good	Steady	Good	Good	Steady
Voltage Swells	Good	Good	Steady	Good	Good	Steady
Transient Overvoltages			N/A			N/A
Flicker			N/A			N/A